

What is claimed is:

1. A circuit comprising:
a template;
a semiconductor material self assembled on said template; and
5 a self assembled connection between the semiconductor material and
the template to form said circuit.
2. The circuit of claim 1, wherein said circuit comprises:
a first metal layer on a substrate;
an insulating layer on said first metal layer;
10 a second metal layer on said insulating layer;
a self-assembled first semi-conductivity type material on one side of
said first metal layer;
a self-assembled second semi-conductivity type material on the other
side of said first metal layer; and
15 a self-assembled nanowire extending between a field concentrator on
said first metal layer and one of said first semi-conductivity type material and
said second semi-conductivity type material to form said self-assembled
connection.

3. The circuit of claim 2, wherein said first semi-conductivity type material comprises a p-type material.
4. The circuit of claim 2, wherein said second semi-conductivity type material comprises an n-type material.
- 5 5. The circuit of claim 2, wherein said self-assembled first semi-conductivity type material comprises organic molecules on one edge of said gold layer.
6. The circuit of claim 2, wherein said self-assembled second semi-conductivity type material comprises organic molecules on one edge of said gold layer.
- 10
7. A method of assembling a circuit, comprising:
providing a template;
enabling a semiconductor material to self assemble on said template;
and
enabling self-assembly of a connection between the semiconductor material and the template to form said circuit.
- 15
8. The method of claim 7, wherein said providing of said template includes providing a field concentrator and wherein said enabling of

self-assembly of said connection comprises establishing said connection
between said concentrator and said semiconductor material.

9. The method of claim 7, wherein said providing of said template
includes providing a field concentrator and wherein said enabling of
5 self-assembly of said connection comprises establishing a connection between
said concentrator and said semiconductor material.

10. The method of claim 9, wherein said enabling self-assembly
comprises:
providing a source of molecules; and
10 applying a driving force which causes the molecules to form a
nanowire between said concentrator and said semiconductor

11. The method of claim 10, wherein said applying of said driving force
comprises applying an electromagnetic field.

12. The method of claim 11, wherein said applying of said driving force
15 further comprises applying a chemical driving force.

13. A method of assembling a circuit comprising:
forming a first metal layer on a substrate;
forming a first insulating layer on said first metal layer;

forming a second metal layer on said first insulating layer;
self-assembling a first semi-conductivity type material on one side of
said first metal layer; and
self-assembling a second semi-conductivity type material on the other
5 side of said first metal layer to form an assembly.

14. The method of claim 13, further comprising:

bringing said assembly into contact with a solution containing
nanoparticles, wherein said first metal layer includes a field concentrator; and
applying a driving force comprising an electromagnetic field which
10 causes the nanoparticles to form a nanowire which extends between said field
concentrator and one of said first semi- conductivity type material and said
second conductivity type material.

15. The method of claim 14, wherein said circuit comprises a logic gate.

16. The method of claim 14, further comprising:

15 forming a second insulating layer; and
forming a third metal layer on the second insulating layer.

17. The method of claim 16, further comprising forming crossovers using
the third metal layer.

18. The method of claim 17, wherein said circuit comprises a logic gate.